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HUMAN RADIATION EXPERIMENTS

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June 10, 1965

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TAN MONTHLY REPORTS FOR 1965
FOLDER H.P. PROGRESS REPORT FOR 5/65

TAN Health Physics Progress
Report for May, 1965
Cord-29-65A

Mr. J. W. McCaslin
O F F I C E

The monthly report of TAN Health Physics Section for May, 1965, is as follows:

PM-2A

Work continues on the PM-2A project. "Hot Shop" entries for installation and adjustment of measurement devices continues to require HP coverage. A personnel shield which can be lowered to inspect the vessel more closely has been constructed. It is a basket type affair with sufficient shielding to allow a person to be lowered from the crane for a few minutes to inspect the vessel.

TAN 607 STACK MONITOR

The "bugs" have apparently all been ironed out of the stack monitor for it has been operating satisfactorily for the entire month. The latest change was a spacer to maintain the proper distance between filter and the detector.

PROPERTY SURVEY

Two personnel from accounting spent most of the month inventorying the TAN property. Most of the equipment charged to H&S was located. Some HP coverage was required for these men as they surveyed the RPSSA area.

HP MONITORING AND SURVEY TRUCKS

Air monitoring and survey equipment in the two HP monitoring trucks have been checked out and put into operation in anticipation of the "high risk" tests contemplated for the SNAPTRAN 2/10A-1 experiments.

RESEARCH ACTIVITIES

In an effort to determine the frequency or probability that we might obtain exposures to airborne radio particulates in a possible sampling program, a check was made of the number of these occurrences over the years 1959 through 1963. In this 4 year interval there were thirty internal exposures greater

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than 100 mrem. These thirty exposures occurred during 7 incidents occurring in the TRA area. Thus it appears that the proposed research project on internal exposures will have a probability of obtaining some real information on the order of 1 to 2 times per year.

The problem associated with wearing lapel samplers in such a research project is also being studied, although it appears that for the low frequency with which one expects significant activity the continuous wearing of lapel samplers may be impracticable.

Other areas of research are being considered as time permits. A final experimental run was made with the gas-flow-tube-technique to determine the half life of Xe-142. The new system used 18 filters and measured the half life of Xe-142 over an almost 5 half life decay. Data reduction is nearly complete and a half life measurement of 1.1 ± 0.1 seconds has been obtained. This value will be reported at the Health Physics Society Meeting next month. A paper describing the technique is being prepared for publication.

STEP

The grid coverage has been stepped up in anticipation of the higher risk tests for the SNAPTRAN 2/10A-1 machine to insure that release data is obtained in the event of fuel element ruptures.

While the reactor was being operated at relatively high temperatures a series of hi-volume air samples were collected to determine the beryllium content in the air surrounding the package. The samples were taken for a three hour period at the rate of approximately 22 cubic feet per minute. Analysis of these samples indicated that the beryllium content in the air was essentially zero.

A Po Be, 8 curie neutron source (2.4×10^7 n/s) was received from Nuclear Materials and Equipment Corporation. The source will be used by STEP Instrumentation personnel to calibrate neutron detectors located in the reactor area.

Neutron measurements using the NAD system were made recently around the unshielded SNAPTRAN reactor during some short transient tests. The results from one dosimeter are as follows:

Detector	nvt at detector, n/cm^2				
	Au < 0.4 ev	Pu > 1 kev	Np > 0.75 mev	U > 1.5 mev	S > 2.5 mev
Energy	5.4×10^9	1.4×10^{11}	7.6×10^{10}	3.3×10^{10}	1.2×10^{10}

Total first collision neutron dose ~ 274 rads. Location of NAD approximately 8 feet from reactor core.

Reactivity inserted (\$)	1.09	Peak power (MW)	61
Reactor period (msec)	8.5	Total energy - estimated (MW-sec)	2.5

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Additional neutron flux measurements have been made routinely at fixed locations using bare and cadmium-covered gold foils. A separate report of these measurements has been prepared and sent to the STEP Experiments Section.

A number of coupled STEP transient tests were completed this period. These were followed by several elevated-temperature coupled-step tests which were to have completed the SNAPTRAN-1 test series. During the last of these tests it was found that the STEP drums were sticking and would not scram to the full out position. Several theories for the cause were postulated, all of which agreed that it was a temperature effect since the drums do not stick at ambient temperature.

With a "directed" extension of the program for an approximate 10 week period for further high temperature tests an investigation of the consequences of these "stuck" drums is being undertaken.

PERSONNEL AND TRAINING

Three Health Physics employees enrolled in the Health Physics training class spent a surprise one day visit in the TAN area as part of their training.

SUMMARY OF ROUTINE WORK

Smears	1300
Direct reading dosimeters issued	15
Body fluid samples	
Routine	50
Special	14
Liquid samples	
Waste water	4
Radioactive shipments	
Off-site	1
On-site	29
Burial ground	5
Laundry	9
Safe work permits	46
Beryllium analysis	1
Safety Meetings	2
Excess exposure requests	0
Whole body analysis	4
Green Tags	110

MAN HOUR TABULATION

Decontamination Manhour Tabulation

Regular assigned hours	352	Time charged to work request listed	356
Overtime	44	Time charged to clothing issue room	
	<u>396</u>	work	40
			<u>396</u>

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EXEMPT	NONEXEMPT	TOTAL	EXEMPT	NONEXEMPT	TOTAL
<u>Scheduled Hours</u>			<u>Actual Hours Worked</u>		
840	1344	2184	730 $\frac{1}{2}$	1315	2045 $\frac{1}{2}$
<u>Overtime</u>			<u>Absences</u>		
0	127	127	S - 9 $\frac{1}{2}$	16	25 $\frac{1}{2}$
			SF - 4	12	16
			V - 56	64	120
			H - 40	64	104
	TOTAL	2311		TOTAL	2311

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